

# PATENT SPECIFICATION

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DRAWINGS ATTACHED



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## (54) IMPROVEMENTS IN OR RELATING TO PRESSURISED AEROSOL DISPENSERS

- (71) We, MINNESOTA 3M LABORATORIES LIMITED, a British Company, of Loughborough, Leicestershire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- The present invention relates to pressurised aerosol dispensers of the kind incorporating a control valve operable to dispense a measured volume of the aerosol material in a burst each time the valve is operated.
- In some dispensers of this kind, the duration of the burst is determined by a metering device which dispenses only a measured volume of the aerosol material each time the valve is operated. An example of such a dispenser is disclosed in British Patent Specification No. 801,899.
- According to a feature of the present invention an aerosol dispenser of the above kind is characterised by a counter for the number of times the valve is operated.
- The provision of a counter in accordance with the invention is of particular value in the case of aerosol dispensers used for medicinal purposes (e.g. inhalants) as the counter provides an indication of the amount of the aerosol material which has been administered.
- It is common practice to provide an adapter or other operating device for use with a pressurised aerosol dispensing container, the valve, and metering device if used, being incorporated in the container and the adapter having means for operating the valve. The counter may then be assembled into the adapter which may, or may not, be used with a succession of containers. The adapter may have means for directing or concentrating the spray of aerosol.
- The invention provides a pressurised aerosol dispenser incorporating a control valve operable to dispense a measured volume of the aerosol material in a burst each time the valve is operated, the dispenser having visual counting means and means to operate the counting means each time the control valve is operated.
- The counting means may show how many measured volumes have been dispensed, or may show how many measured volumes remain available for use in the dispenser.
- In one form of the invention in which the control valve is reciprocable linearly to dispense a burst, the counting means comprises a rotatable scale and there is a mechanism to rotate the scale each time the valve is reciprocated. In this case the counting means may be incorporated in an adapter separable from the pressurised container of aerosol material, the adapter being arranged to guide the container for linear reciprocation to operate the valve and the counting means.
- More particularly the counting means may be a ring rotatable within the adapter, and may be viewed through an aperture in a wall of the adapter.
- According to a further feature of the invention the counting means has at least two indicator elements any one or more of which can be set at will to a chosen value by a user.
- Advantageously one of the indicator elements can register multiples of those units registered by the other element.
- According to another further feature of the invention the dispenser incorporates a mouth piece or nose piece suitable for accommodating a user's mouth or nostrils when the dispenser is used as an inhaler.
- In a specific form of the invention there is a cylindrical pressurised container for the aerosol material, to which container the control valve is connected, and a generally cylindrical adaptor constructed to receive and constrain at least part of the cylindrical container for axial movement and having a mouth piece through which the aerosol material can be discharged, in which the indicator means comprises coaxial with each other and the axes of the container and the

adapter, one of which rings is rotatable by the other ring at a fraction of the rotational displacement thereof, and there is an operating sleeve, a part of which lies within and is coaxial with the rings, and having a first abutment engageable with a face of the container, and a second abutment engageable with an opposed face of the one ring, which operating sleeve is urged against the said face of the container by spring means, and is moveable by the container, when the control valve is operative to dispense a burst, to rotate the other ring, so to indicate that a burst has been dispensed.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is a side view of the dispenser; and

Figure 2 is a section taken on the line 2—2 in Figure 1.

The dispenser comprises a pressurised aerosol dispensing container 10 of the kind having a projecting stem incorporating a valve member 11 which when depressed causes emission of a measured quantity of the contents from the container through the valve member. There are many ways in which a measured quantity of the contents can be ejected each time the stem is depressed.

The aerosol material in this example contains a medicated composition for the relief of asthma, like conditions and other ailments in which inhalation can be used in prophylaxis and treatment.

Surrounding the container is an adapter 12 having a tubular sleeve 13 which is of generally the same shape as the container, to receive the aerosol dispensing container for sliding movement therein. The adapter has a tubular extension 14 which forms a mouth piece for directing the aerosol spray into the user's mouth when used for an inhalant. The mouth piece has a removable cover (not shown).

The adapter is provided with an internal pillar 15 which receives the valve member 11, and depression of the container 10 in the sleeve 13 causes the valve member 11 to be pressed into the container to release its measured quantity of fluid. There is an orifice 16 in the pillar to allow passage of the fluid from the member 11.

Mounted within the sleeve 13 there are two rings 17 and 18 which are rotatable about the axis of the sleeve. There is also mounted within the rings a tube 19 having an annular flange 20 at one end which bears on the valve ferrule of the aerosol dispensing container 10. There is a coil spring 21 between the flange 20 and the ring 18. There is a window 22 at some position in the sleeve in register with the two rings 17 and 18 and

the ring 18 is arranged to be numbered for examples from 1 to 100. The ring 17 is arranged to be numbered say from 1 to 10 and is connected to the ring 18 by a suitable mechanism so that each time the ring 18 reaches one hundred the ring 17 rotates by one step to indicate the number of hundreds.

The ring 18 is provided with a ring of ratchet teeth 25.

The outer periphery of the tube 19, which is guided for up and down movement with the container 10, is provided with a tooth 24 engageable with the teeth 25, the arrangement being such that each time the aerosol container 10 is depressed in the sleeve 13 to release a shot from the valve member 11 the ring 18 is rotated by an amount equivalent to one numeral on its external circumference.

In this way the rings 17 and 18 between them indicate in the window 22 how many shots have been taken from the aerosol dispensing container.

#### WHAT WE CLAIM IS:—

1. A pressurised aerosol dispenser incorporating a control valve operable to dispense a measured volume of the aerosol material in a burst each time the valve is operated, the dispenser having visual counting means and means to operate the counting means each time the control valve is operated.

2. A dispenser as claimed in claim 1 in which the counting means shows how many measured volumes have been dispensed.

3. A dispenser as claimed in claim 1 in which the counting means shows how many measured volumes remain available for use in the dispenser.

4. A dispenser as claimed in any of the preceding claims in which the control valve is reciprocable linearly to dispense a burst, the counting means comprises a rotatable scale and there is a mechanism to rotate this scale one step each time the valve is reciprocated.

5. A dispenser as claimed in claim 4 in which the counting means is incorporated in an adapter separable from the pressurised container of aerosol material, the adapter being arranged to guide the container for linear reciprocation to operate the valve and the counting means.

6. A dispenser as claimed in claim 5 in which the counting means comprises a ring including the rotatable scale which ring is rotatable within the adapter and can be viewed through an aperture in a wall of the adapter.

7. A dispenser as claimed in any one of claims 1 to 3 in which the counting means has at least two indicator elements any one or more of which can be set at will to a chosen value by a user.

8. A dispenser as claimed in claim 7

in which one of the indicator elements registers multiples of those units registered by another element.

- 5 9. A dispenser as claimed in any one of the preceding claims in which the dispenser incorporates a mouth piece or nose piece suitable for application to a user's mouth or nostrils when the dispenser is used as an inhaler.
- 10 10. A dispenser as claimed in claim 1 in which there is a cylindrical pressurised container for the aerosol material to which container the control valve is connected, and a generally cylindrical adapter constructed to receive and constrain at least
- 15 part of the cylindrical container for axial movement and having a mouth piece through which the aerosol material can be discharged, in which the visual counting means comprises two adjacent rings rotatable with-
- 20 in the adapter and coaxial with each other and the axes of the container and the

adapter, one of which rings is rotatable by the other ring at a fraction of the rotational displacement thereof, and there is an operating tube or sleeve, a part of which lies within and is coaxial with the rings, and having a first abutment engageable with a face of the container, and a second abutment engageable with an opposed face of the one ring, which operating sleeve is pressed against the said face of the container by spring means, and is moveable by the container, when the control valve is operated to dispense a burst, to rotate the other ring, so to indicate that a burst has been dispensed.

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11. A dispenser substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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